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EXAMINER	
SANDIFER, MATTHEW D	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/574,291	HODE, JEAN-MICHEL	
	Examiner	Art Unit	
	MATTHEW SANDIFER	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 March 2006 and 22 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 March 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/31/06, 5/12/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The instant application having Application No. 10/574,291 filed on 3/31/2006 and 11/22/2006 is presented for examination by the examiner.

Examiner Notes

2. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the general concept of the claimed invention in a clear and understandable manner as described in the specification. The flowcharts in Figures 1-2 display a series of undefined formulas and variables that does not enable an understanding of the claimed invention. The Examiner requests that at least Figures 1-2 be corrected so as to enable an understanding of the method as claimed in Claim 1.

Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in

compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The abstract of the disclosure is objected to because it is longer than one paragraph and more than 150 words. The abstract should be in narrative form and generally limited to a single paragraph within the range of 50 to 150 words. The abstract should not exceed 15 lines of text. Correction is required. See MPEP § 608.01(b).

Claim Objections

5. Claims 7-11 and 13-17 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Appropriate correction is required.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Claims 1-17 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As per Claims 1-10, a method claim must (1) be tied to another statutory class (a particular machine or apparatus) or (2) transform underlying subject matter (such as an article or materials) to a different state or thing. If neither of these requirements is met by the claim, the method is not a patent eligible process under § 101 and should be rejected as being directed to non-statutory subject matter.

Regarding Claim 1, applicant has claimed a method for generating noise comprising steps for generating noise via sequences, choosing subsequences, and choosing a sign value. The claimed method steps for choosing, altering, and generating sequences are mental or logical steps that are able to be performed without the use of a particular machine, system or apparatus. Furthermore, the claimed method as a whole does not explicitly require physical hardware.

Therefore the method is not required to be implemented by a particular machine, and the claim is directed to non-statutory subject matter.

Claims 2-10 are rejected under 35 U.S.C. 101 as non-statutory for at least the reason stated above. Claims 2-10 are dependant on claim 1; however, they do not add any feature or subject matter that would solve the non-statutory deficiencies of claim 1.

Claim 11 is rejected under 35 U.S.C. 101 as directed to non-statutory subject matter of software, *per se*. In this case, applicant has claimed a device implementing the method of any one of claims 1 to 10, comprising means-for limitations for implementing the method of claim 11. However, there is no corresponding structure found in the specification required to support the means-plus-function limitations, see Figure 6 and paragraphs 0083-0085 of the instant specification. Therefore, the claim is not interpreted under 35 U.S.C. 112, 6th paragraph. Since the limitations of the claim are mental or logical steps that do not explicitly require tangible hardware from their descriptions in the claim language or instant specification, the claim can be interpreted as software alone. Thus the claim lacks the necessary physical articles or objects to constitute a machine or manufacture within the meaning of 35 U.S.C. 101. As such, it fails to fall within a statutory category. It is considered software *per se*, therefore the claims are directed to non-statutory subject matter.

Claims 12-14 are rejected under 35 U.S.C. 101 as non-statutory for at least the reason stated above. Claims 12-14 are dependant on claim 11; however, they do not add any feature or subject matter that would solve the non-statutory deficiencies of claim 11.

Claims 15-17 are rejected under 35 U.S.C. 101 as directed to non-statutory subject matter of software, *per se*. The claims are directed to embodiments comprising the device of claim 11. However, the device of claim 11 is directed to non-statutory subject matter as described above. Furthermore, a digital analog converter, frequency synthesis system, and sigma delta modulator as claimed in claims 15-17 respectively do not explicitly require tangible hardware from their descriptions in the claim language, and are not described in the instant specification. The operations of converting a digital signal to an analog signal and vice versa, and synthesizing a signal, can all be accomplished mathematically and thus are mental or logical operations. Therefore, without an explicit recitation of any machine or hardware implementation of the embodiments, the claims can be interpreted as software alone. Thus the claims lack the necessary physical articles or objects to constitute a machine or manufacture within the meaning of 35 U.S.C. 101. As such, they fail to fall within a statutory category and are considered software *per se*, therefore the claims are directed to non-statutory subject matter.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 11-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed

invention. Regarding claims 11-17, the claim recites a "device" comprising "means of" limitations that are presumed to invoke the provisions of 35 U.S.C. 112, 6th paragraph. However, there is no corresponding structure found in the specification required to support the means-plus-function limitations. In Figure 6 and paragraphs 0083-0085 of the instant specification, the means-for limitations of claim 11 are described only by means-for language, wherein the means-for description corresponds to Figure 6 which is generally unlabelled and indefinite. Thus, one skilled in the art would not recognize what structure would perform the acts recited by the limitations of claim 11, even inherently or implicitly. For instance, without a description of what structure would implement "means of successive provision of several sequences" and "means of selection of M subsequences in a random and independent manner", and "means of selection…of the sign applied to each of the chosen subsequences", as claimed in claim 11, one skilled in the art would not be reasonably apprised of a corresponding structure for making and using the claimed invention. See MPEP § 2181.

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

11. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding Claim 1, the meanings of the claimed formulas are generally unclear and render the claim vague and indefinite. The variables "k", "l", "m" and "n" are undefined in the

claim, and it is unclear if these represent static constants or not, or what values they would take on if they are not static variables.

Additionally, it is unclear how the choosing of a subsequence(s) relates to the sequence and to the generation of noise. Because the definitions of a sequence as h(kN+n) and a subsequence as $h_{lm}(n)$ are largely unclear, a relationship between the two cannot be established, and it appears as though the selection of subsequence(s) is independent and not directed toward the solution of generating noise. For the purposes of examination, the claim is interpreted to mean that the selected subsequences are output in succession, wherein the succession of selected subsequences is defined as a sequence, and wherein multiple sequences are output. Thus, in the case of selection of a single subsequence, the subsequence and sequence are one and the same.

The meaning of the limitation "M.N points" is also unclear. For purposes of examination, "M.N points" is interpreted to mean M multiplied by N points, because selecting M subsequences of N points each would result in M x N points.

Claims 11 and 15-17 are also rejected under the rationale as described above.

Regarding Claims 6 and 14, the formulas recited in the claims are also undefined and unclear, as described in the rejection of Claim 1 above.

Regarding Claim 5, the variable E is not defined and its meaning is unclear.

Regarding Claim 11, the claim recites a device with means for performing the steps of the method of Claim 1, and "implementing the method of any one of the claims 1 to 10". However, the claims only recites means for implementing the method of claim 1, and is therefore not enabled to implement the method steps of claims 2-10. Thus the claim fails to particularly point out the subject matter of the invention being claimed.

Regarding Claims 11-17, the claimed "means for" limitations are presumed to invoke the provisions of 35 U.S.C. 112, 6th paragraph. However, there is no corresponding structure found in the specification required to support the means-plus-function limitations. Since the instant specification lacks the description necessary to support the invoking of 35 U.S.C. 112, 6th paragraph, the applicant has failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112. See MPEP § 2181.

Claims 2-4, 7-10, and 12-13 are also rejected for being dependent on their respective rejected base claims.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider et al. (US 2004/0095167) (hereinafter Schneider) in view of Gabet et al. (US 6,559,712) (hereinafter Gabet) and in view of Chu, "Fast Gaussian Noise Generator".

As per Claim 1, Schneider discloses a method for generating agitation noise comprising an arbitrary number of points, with predetermined statistical distribution (Page 1, paragraphs 0014 and Page 3, paragraph 0045 and Page 4, paragraph 0059 and Figure 11, noise is generated according to a predetermined statistical distribution, such as a Gaussian noise histogram, by serially outputting samples until an arbitrary number of samples, i.e. time duration, has been reached); comprising the generation of noise by a succession of several sequences $\{h(kN+n)\}_{1\leq n\leq N}$ of M.N points (M, N integers ≥ 1) (Page 3, paragraph 0046 and 0048-0049, a succession of several samples is provided to generate a noise waveform, wherein a sample is a sequence of MxN points for N=1 and M=1); the choosing for each sequence of M basic subsequence(s) $\{h_{lm}(n)\}_{1\leq n\leq N,\, m\leq M}$ in a random and independent manner from among at least L basic subsequence(s) of N points (L integer ≥ 1) (Page 3, paragraph 0046 and 0048-0049, M=1 basic subsequence is randomly chosen from a plurality = L of memory locations and output as a sequence, i.e. one sample is randomly addressed and output from a plurality of memory locations, wherein a succession of the randomly addressed samples generates a noise waveform).

Schneider does not explicitly disclose generating agitation noise with predetermined histogram and shaped around at least one arbitrary frequency, a subsequence is shaped around a predetermined frequency, and choosing in a random and independent manner, for each sequence, of the sign s applied to each of the chosen subsequences.

However, Gabet discloses generating agitation noise with predetermined histogram, shaped around at least one arbitrary frequency, and a subsequence is shaped around a predetermined frequency (Figures 5-6 and Column 2, lines 39-44 and Column 4, lines 64-67, a set of Gaussian noise samples is generated with a predetermined histogram, wherein the set is shaped around frequencies 0 and fh/4; Schneider, Page 3, paragraphs 0045-0046 and Page 4, paragraphs 0058 and 0060 and 0065, wherein a set of Gaussian noise samples is stored as subsequences, wherein the finally generated Gaussian noise preserves the spectral characteristics of the stored subsequences).

Furthermore, Chu discloses choosing in a random and independent manner, for each sequence, of the sign s applied to each of the chosen subsequences (Figures 1-2, the sign of each sample of a Gaussian noise sequence is randomly chosen).

Schneider, Gabet, and Chu are analogous art because all are directed to noise waveform generation.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the generation of Gaussian noise samples as taught by Chu the waveform generator of Schneider because it provides for the implementation of the sample generator of Schneider in a fast and memory-efficient manner (Schneider, Figure 9 and Page 5, paragraph 0067, the waveform generator includes a memory-saving Gaussian sample generator for storing samples in the noise kernel; Chu, Introduction Section, the Gaussian noise generator requires small amount of memory and achieves significant speedup over floating-point generators); and would have been obvious to one of ordinary skill in the art at the time of invention to apply the Gaussian noise spectral characteristics as taught by Gabet to the teachings of Schneider because

it provides the advantage and flexibility of using the noise waveform generator of Schneider for additional processing operations such as dithering, and provides the dither generator of Gabet with a noise waveform generator that advantageously requires minimal memory and provides fast operation (Gabet, Column 1, lines 18-27 and 45-50 and 55-57 and Column 4, lines 20-25 and 40-44, A/D converters and frequency synthesizers utilize the dither generator of Gabet wherein specifying frequency characteristics provide noise samples that efficiently do not encroach on the useful signals to perform a dithering operation; Schneider, Page 1, paragraphs 0008-00011 and 0013-0014 and Page 5, paragraphs 0067-0068, noise samples may be generated according to spectral characteristics specified by a user for a particular purpose, wherein the waveform generator provides fast noise generation and low memory requirements for implementation in digital signal processors).

As per Claim 2, Schneider discloses the method for generating agitation noise according to claim 1 wherein choosing in a random and independent manner, for each sequence, of the direction of temporal reading R of each of the chosen basic subsequences (Page 3, paragraph 0048, the subsequence, i.e. sample, for each sequence is randomly chosen such that each chosen subsequence is randomly a later sample or earlier sample, i.e. higher or lower memory address, of the stored set of noise samples).

As per Claim 3, Schneider discloses the method for generating agitation noise according to claim 1 wherein M=1 (Page 3, paragraph 0049, a series of sequences is output to the DA converter, wherein a sequence comprises the selection of M=1 subsequence of N=1 point, i.e. a

sequence comprises the selection of one noise sample).

As per Claim 4, Schneider discloses the method for generating agitation noise according to claim 1 wherein the predetermined shaping frequency of the basic subsequences is equal to the arbitrary shaping frequency of the noise (Page 4, paragraphs 0058 and 0065 and Page 5, paragraph 0070, the memory blocks store e.g. .01 seconds of Gaussian noise, wherein the Gaussian noise is shaped around a frequency as described above e.g. fh/4, and wherein a subsequence of the length of a memory block stores e.g. 10 microseconds of noise, such that the resulting output sequence and resulting output noise exhibits the same spectral shaping frequency of the subsequence).

As per Claim 5, Schneider discloses the method for generating agitation noise according to claim 1, wherein for each sequence, several subsequences are chosen (Figure 11, a sequence may comprise a consecutive number of memory blocks, i.e. subsequences).

Furthermore, Gabet discloses for each sequence, the interleaving E of several subsequences (Column 6, lines 26-32, a sequence of Gaussian samples may be interleaved with itself, i.e. oversampled; therefore the sequence comprising consecutive subsequences may be interleaved with itself).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the Gaussian noise spectral characteristics as taught by Gabet to the teachings of Schneider because it provides the advantage and flexibility of using the noise waveform generator of Schneider for additional processing operations such as dithering, and provides the

dither generator of Gabet with a noise waveform generator that advantageously requires minimal memory and provides fast operation (Gabet, Column 1, lines 18-27 and 45-50 and 55-57 and Column 4, lines 20-25 and 40-44, A/D converters and frequency synthesizers utilize the dither generator of Gabet wherein specifying frequency characteristics provide noise samples that efficiently do not encroach on the useful signals to perform a dithering operation; Schneider, Page 1, paragraphs 0008-00011 and 0013-0014 and Page 5, paragraphs 0067-0068, noise samples may be generated according to spectral characteristics specified by a user for a particular purpose, wherein the waveform generator provides fast noise generation and low memory requirements for implementation in digital signal processors).

As per Claim 6, Schneider discloses the method for generating agitation noise according to claim 1 wherein the interleaved subsequences are either the M subsequences $\{h_{lm}(n)\}_{1\leq n\leq N,\, m\leq M}$ chosen from among L basic subsequences, or the ones part of the M chosen subsequences $\{h_{lm}(n)\}_{1\leq n\leq N,\, m\leq M}$ from among L basic subsequences, or several subsequences obtained by interleaving of several basic subsequences $\{h_l(n)\}_{1\leq n\leq N}$ (Figures 10-11, noise generated for a time duration comprises a succession of sequences, wherein a sequence comprises selecting memory blocks as subsequences, wherein a consecutive number of M subsequences are chosen randomly, wherein the sequence may be interleaved as described in the rejection of Claim 5 above).

As per Claim 7, Schneider discloses the method for generating agitation noise according to claim 5 wherein M=L (Page 6, paragraphs 0082-0083, the number of consecutive memory

blocks M may be the total number of memory blocks L, wherein the number M of selected subsequences for a sequence is L = M).

As per Claim 8, Schneider does not explicitly disclose the method for generating agitation noise according to claim 5 wherein the predetermined shaping frequency of the basic subsequences is equal to double at least one of the arbitrary shaping frequencies of the noise.

However, Gabet discloses wherein the predetermined shaping frequency of the basic subsequences is equal to double at least one of the arbitrary shaping frequencies of the noise (Column 6, lines 26-32, a subsequence of Gaussian samples with a shaping frequency of e.g. fh/2 may be oversampled, i.e. interleaved, producing a shaping frequency of fh/4; thus a subsequence with shaping frequency fh/2 (= double fh/4) is interleaved with itself thus producing noise with shaping frequency fh/4).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the Gaussian noise spectral characteristics as taught by Gabet to the teachings of Schneider because it provides the advantage and flexibility of using the noise waveform generator of Schneider for additional processing operations such as dithering, and provides the dither generator of Gabet with a noise waveform generator that advantageously requires minimal memory and provides fast operation (Gabet, Column 1, lines 18-27 and 45-50 and 55-57 and Column 4, lines 20-25 and 40-44, A/D converters and frequency synthesizers utilize the dither generator of Gabet wherein specifying frequency characteristics provide noise samples that efficiently do not encroach on the useful signals to perform a dithering operation; Schneider, Page 1, paragraphs 0008-00011 and 0013-0014 and Page 5, paragraphs 0067-0068, noise

samples may be generated according to spectral characteristics specified by a user for a particular purpose, wherein the waveform generator provides fast noise generation and low memory requirements for implementation in digital signal processors).

As per Claim 9, Schneider discloses the method for generating agitation noise according to claim 1 wherein the choosing of a basic subsequence $\{h_l(n)\}_{1\leq n\leq N}$ leads to the reading of this basic subsequence in storage means (Page 3, paragraphs 0046 and 0049, subsequences are read from the storage means of the noise kernel).

As per Claim 10, Schneider discloses the method for generating agitation noise according to claim 1 wherein the basic subsequences $\{h_l(n)\}_{1\leq n\leq N}$ are equiprobable signals shaped around a predetermined frequency (Page 3, paragraph 0048, each subsequence is randomly chosen with a uniform distribution, i.e. the subsequences are equiprobably selected and output as signals).

As per Claims 11-12, they are device claims comprising the limitations of the method of Claims 1-2, respectively. Therefore Claims 11-12 are rejected under the same rationale as presented in the rejections of Claims 1-2 above, respectively.

As per Claim 13, it is a device claim comprising the limitations of the method of Claim 5. Therefore Claim 13 is rejected under the same rationale as presented in the rejection of Claim 5 above.

As per Claim 14, it is a device claim comprising the limitations of the method of Claim 9. Therefore Claim 14 is rejected under the same rationale as presented in the rejection of Claim 9 above.

As per Claim 15, an agitation noise generation device as claimed in claim 11 is disclosed as described above.

Gabet discloses a digital analog converter comprising an agitation noise generation device (Column 1, lines 9-14 and Column 6, lines 46-48).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the Gaussian noise spectral characteristics as taught by Gabet to the teachings of Schneider because it provides the advantage and flexibility of using the noise waveform generator of Schneider for additional processing operations such as dithering, and provides the dither generator of Gabet with a noise waveform generator that advantageously requires minimal memory and provides fast operation (Gabet, Column 1, lines 18-27 and 45-50 and 55-57 and Column 4, lines 20-25 and 40-44, A/D converters and frequency synthesizers utilize the dither generator of Gabet wherein specifying frequency characteristics provide noise samples that efficiently do not encroach on the useful signals to perform a dithering operation; Schneider, Page 1, paragraphs 0008-00011 and 0013-0014 and Page 5, paragraphs 0067-0068, noise samples may be generated according to spectral characteristics specified by a user for a particular purpose, wherein the waveform generator provides fast noise generation and low memory requirements for implementation in digital signal processors).

As per Claim 16, an agitation noise generation device as claimed in claim 11 is disclosed as described above.

Gabet discloses a frequency synthesis system comprising an agitation noise generation device (Column 1, lines 18-27).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the Gaussian noise spectral characteristics as taught by Gabet to the teachings of Schneider because it provides the advantage and flexibility of using the noise waveform generator of Schneider for additional processing operations such as dithering, and provides the dither generator of Gabet with a noise waveform generator that advantageously requires minimal memory and provides fast operation (Gabet, Column 1, lines 18-27 and 45-50 and 55-57 and Column 4, lines 20-25 and 40-44, A/D converters and frequency synthesizers utilize the dither generator of Gabet wherein specifying frequency characteristics provide noise samples that efficiently do not encroach on the useful signals to perform a dithering operation; Schneider, Page 1, paragraphs 0008-00011 and 0013-0014 and Page 5, paragraphs 0067-0068, noise samples may be generated according to spectral characteristics specified by a user for a particular purpose, wherein the waveform generator provides fast noise generation and low memory requirements for implementation in digital signal processors).

14. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider in view of Gabet and in view of Chu, and further in view of Gomez et al. (US 6,326,911) (hereinafter Gomez).

As per Claim 17, an agitation noise generation device as claimed in claim 11 is disclosed as described above.

Gomez discloses a sigma delta modulator comprising an analog digital converter on the direct channel, a noise generation device, an adder adding the agitation noise generated by the agitation noise generation device to the input of the analog digital converter, and a digital analog converter on the return channel (Figure 1 and Column 5, lines 20-25, a sigma delta modulator comprises an analog to digital converter 18, dither generation device 20, an adder 19 adding the dither noise to the input of the A/D converter, and a digital to analog converter 16 on the feedback channel).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to apply the sigma delta modulator embodiment as taught by Gomez to the teachings of Schneider, Gabet, and Chu because it provides the advantage and flexibility of using the noise waveform generator of Schneider for additional processing operations such as dithering, and provides the sigma delta modulator with a fast dither noise generator that requires minimal memory (Gomez, Column 2, lines 6-14 and Column 5, lines 20-25, a dither generator comprises the output of a random noise sequence to a D/A converter; Schneider, Page 1, paragraphs 0008-00011 and 0013-0014, random noise generator provides fast noise generation and low memory requirements for implementation in digital signal processors).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 6,337,643 Method and device for generating a random signal and digital-to-analog converting systems using same, describes using a random noise generator for dithering in sigma-delta and A/D converters

US 5,497,154 Dither generating apparatus, discloses a random dither generator for randomly addressing and outputting lookup table values

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW SANDIFER whose telephone number is (571) 270-5175. The examiner can normally be reached on 8:30am - 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lewis Bullock can be reached on (571) 272-3759. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chat C. Do/
Primary Examiner, Art Unit 2193

/M. S./
Examiner, Art Unit 2193